

IN THE CLAIMS

Please amend the claims as follows:

1. (Currently Amended) A valve manifold for a pressure swing adsorption system having at least one pressure vessel, said valve manifold comprising:

a body having a first cavity, a first passage and a first channel, said first cavity being adapted to fluidly connect to the at least one pressure vessel, said first passage connecting said first channel to said first cavity, said body having a second passage connecting said first channel to said first cavity; and

a first valve provided within said first passage, said first valve being configured to selectively permit and restrict flow between said first channel and said first cavity via said first passage; and

a second valve provided within said second passage, said second valve being configured to selectively permit and restrict fluid flow between said first channel and said first cavity via said second passage,

wherein said first passage and said second passage are directly connected to said first channel, and

wherein said first valve is configured to not restrict flow along said first channel.

2. (Currently Amended) ~~The~~ A valve manifold ~~according to Claim 1~~ for a pressure swing adsorption system having at least one pressure vessel, said valve manifold comprising:

a body having a first cavity, a first passage and a first channel, said first cavity being adapted to fluidly connect to the at least one pressure vessel, said first passage connecting said first channel to said first cavity; and

a first valve provided within said first passage, said first valve being configured to selectively permit and restrict flow between said first channel and said first cavity via said first passage, wherein:

said body has a second passage and a second channel, said second passage connecting said second channel to said first cavity; ~~and~~

said valve manifold further comprises a second valve provided within said second passage, said second valve being configured to selectively permit and restrict fluid flow between said second channel and said first cavity; and

said first channel and said second channel are connected to a same side of said first cavity.

3. (Original) The valve manifold according to Claim 2, wherein said first channel and said second channel are configured to provide a parallel flow connection to said first cavity.

4.-5. (Cancel)

6. (Currently Amended) The valve manifold according to Claim ~~5~~ 1, wherein:

said body has a second channel and a third passage, said third passage connecting said second channel to said first cavity; and

said valve manifold further comprises a third valve provided within said third passage, said third valve being configured to selectively permit and restrict fluid flow between said second channel and said first cavity via said third passage.

7. (Currently Amended) The valve manifold according to Claim ~~1~~ 2, further comprising:

a second cavity in said body adapted to fluidly connect to another pressure vessel, said body having a ~~second~~ third passage connecting said first channel to said second cavity; and

a ~~second~~ third valve provided within said ~~second~~ third passage, said ~~second~~ third valve being configured to selectively permit and restrict flow between said first channel and said second cavity.

8. (Currently Amended) The valve manifold according to Claim 7, wherein:

said body has a ~~second channel, a third passage and~~ a fourth passage, ~~said third passage connecting said second channel to said first cavity;~~ said fourth passage connecting said second channel to said second cavity;

~~said valve manifold further comprises a third valve provided within said third passage, said third valve being configured to selectively permit and restrict flow between said second channel and said first cavity; and~~

said valve manifold further comprises a fourth valve provided within said fourth passage, said fourth valve being configured to selectively permit and restrict flow between said second channel and said second cavity.

9. (Original) The valve manifold according to Claim 8, wherein said first channel and said second channel are configured to provide a parallel flow connection between said first cavity and said second cavity.

10. (Currently Amended) The valve manifold according to Claim 1, wherein said ~~first~~ second valve is configured to not restrict flow along said first channel.

11. (Currently Amended) The valve manifold according to Claim 1, wherein said

first valve is configured to not restrict flow within said first cavity.

12. (Currently Amended) The valve manifold according to Claim 1, wherein said body further comprises a sensor port connected to said first cavity.

13. (Original) The valve manifold according to Claim 1, wherein said body further comprises a sensor port connected to said first passage.

14. (Original) The valve manifold according to Claim 1, wherein said body further comprises a sensor port connected to said first channel.

15. (Canceled)

16. (Original) The valve manifold according to Claim 1, wherein said first passage includes a valve seat and a valve port in which said first valve is received.

17. (Original) The valve manifold according to Claim 16, wherein said valve seat is concentric with said valve port.

18. (Original) The valve manifold according to Claim 1, wherein said first valve includes a valve seal configured to be selectively actuated between a sealed contact position with a valve seat in said first passage wherein said first channel is sealed from said first cavity and a non-contact position with said valve seat, said first valve further including a secondary seal member having a metering orifice.

19.-21. (Canceled)

22. (Currently Amended) A valve manifold for a pressure swing adsorption system having at least one pressure vessel, said valve manifold comprising:

a body having a cavity, a first passage, a second passage and a channel, said cavity being adapted to fluidly connect to the at least one pressure vessel, said first passage

connecting said channel to said cavity, said second passage connecting said channel to said cavity;

first means for selectively permitting and restricting fluid flow between said channel and said cavity through said first passage; and

second means for selectively permitting and restricting fluid flow between said channel and said cavity through said second passage,

wherein said first passage and said second passage are directly connected to said channel, and

wherein said first means is configured to not restrict flow along said channel.

23. (Currently Amended) A pressure swing adsorption system comprising:

a first pressure vessel having a first opening; and

a first valve manifold comprising:

a first body having a first cavity, a first passage and a first channel, said first cavity being fluidly connected to said first opening of said first pressure vessel, said first passage connecting said first channel to said first cavity, said body having a second passage connecting said first channel to said first cavity; and

a first valve provided within said first passage, said first valve being configured to selectively permit and restrict flow between said first channel and said first cavity via said first passage; and

a second valve provided within said second passage, said second valve being configured to selectively permit and restrict fluid flow between said first channel and said first cavity via said second passage,

wherein said first passage and said second passage are directly connected to said first channel, and

wherein said first valve is configured to not restrict flow along said first channel.

24. (Currently Amended) ~~The~~ A pressure swing adsorption system ~~according to Claim 23 comprising:~~

a first pressure vessel having a first opening; and

a first valve manifold comprising:

a first body having a first cavity, a first passage and a first channel, said first cavity being fluidly connected to said first opening of said first pressure vessel, said first passage connecting said first channel to said first cavity; and

a first valve provided within said first passage, said first valve being configured to selectively permit and restrict flow between said first channel and said first cavity via said first passage, wherein:

said first body has a second passage and a second channel, said second passage connecting said second channel to said first cavity; ~~and~~

said first valve manifold further comprises a second valve provided within said second passage, said second valve being configured to selectively permit and restrict fluid flow between said second channel and said first cavity; and

wherein said first channel and said second channel are connected to a same side of said first cavity.

25. (Original) The pressure swing adsorption system according to Claim 24, wherein

said first channel and said second channel are configured to provide a parallel flow connection to said first cavity.

26.-27. (Cancel)

28. (Currently Amended) The pressure swing adsorption system according to Claim ~~27~~ 23, wherein:

said first body has a second channel and a third passage, said third passage connecting said second channel to said first cavity; and

said first valve manifold further comprises a third valve provided within said third passage, said third valve being configured to selectively permit and restrict fluid flow between said second channel and said first cavity via said third passage.

29. (Currently Amended) The pressure swing adsorption system according to Claim 23, further comprising a second pressure vessel having a second opening, wherein said first valve manifold further comprises:

a second cavity in said first body being fluidly connected to said second opening of said second pressure vessel, said first body having a ~~second~~ third passage connecting said first channel to said second cavity; and

a ~~second~~ third valve provided within said ~~second~~ third passage, said ~~second~~ third valve being configured to selectively permit and restrict flow between said first channel and said second cavity.

30. (Currently Amended) The pressure swing adsorption system according to Claim 29, wherein:

said first body has a second channel, ~~a third passage~~ and a fourth passage, ~~said third~~

~~passage connecting said second channel to said first cavity;~~ said fourth passage connecting said second channel to said second cavity;

~~said first valve manifold further comprises a third valve provided within said third passage, said third valve being configured to selectively permit and restrict flow between said second channel and said first cavity; and~~

said first valve manifold further comprises a fourth valve provided within said fourth passage, said fourth valve being configured to selectively permit and restrict flow between said second channel and said second cavity.

31. (Original) The pressure swing adsorption system according to Claim 30, wherein said first channel and said second channel are configured to provide a parallel flow connection between said first cavity and said second cavity.

32. (Previously Presented) The pressure swing adsorption system according to Claim 23, wherein:

said first valve is configured to not restrict flow along said first cavity.

33. (Currently Amended) The pressure swing adsorption system according to Claim 23, further comprising:

a second pressure vessel having a second opening; and

a second valve manifold comprising:

a second body having a second cavity, a ~~second~~ third passage and a second channel, said second cavity being fluidly connected to said second opening of said second pressure vessel, said ~~second~~ third passage connecting said second channel to said second cavity, said second channel being in fluid connection with said first channel; and

a ~~second~~ third valve provided within said ~~second~~ third passage, said ~~second~~ third valve being configured to selectively permit and restrict flow between said second channel and said second cavity via said ~~second~~ third passage.

34. (Currently Amended) The pressure swing adsorption system according to Claim 33, wherein:

said first body has a third channel and a ~~third~~ fourth passage, said ~~third~~ fourth passage connecting said third channel to said first cavity;

said first valve manifold further comprises a ~~third~~ fourth valve provided within said ~~third~~ fourth passage, said ~~third~~ fourth valve being configured to selectively permit and restrict flow between said third channel and said first cavity;

said second body has a fourth channel and a ~~fourth~~ fifth passage, said ~~fourth~~ fifth passage connecting said fourth channel to said second cavity, said fourth channel being in fluid connection with said third channel; and

said second valve manifold further comprises a ~~fourth~~ fifth valve provided within said ~~fourth~~ fifth passage, said ~~fourth~~ fifth valve being configured to selectively permit and restrict flow between said fourth channel and said second cavity.

35. (Original) The pressure swing adsorption system according to Claim 34, wherein said fluid connection between said first and second channels and said fluid connection between said third and fourth channels are configured to provide a parallel flow connection between said first cavity and said second cavity.

36. (Currently Amended) The pressure swing adsorption system according to Claim 33, wherein:

said first valve is configured to not restrict flow along said first cavity;

~~said first valve is configured to not restrict flow along said first channel;~~

said ~~second~~ third valve is configured to not restrict flow along said second cavity; and

said ~~second~~ third valve is configured to not restrict flow along said second channel.

37. (Currently Amended) The pressure swing adsorption system according to Claim 33, further comprising:

a third pressure vessel having a third opening; and

a third valve manifold comprising:

a third body having a third cavity, a ~~third~~ fourth passage and a third channel, said third cavity being fluidly connected to said third opening of said third pressure vessel, said ~~third~~ fourth passage connecting said third channel to said third cavity, said third channel being in fluid connection with said first channel and said second channel; and

a ~~third~~ fourth valve provided within said ~~third~~ fourth passage, said ~~third~~ fourth valve being configured to selectively permit and restrict flow between said third channel and said third cavity via said ~~third~~ fourth passage.

38. (Currently Amended) The pressure swing adsorption system according to Claim 37, wherein:

said first valve is configured to not restrict flow along said first cavity;

~~said first valve is configured to not restrict flow along said first channel;~~

said ~~second~~ third valve is configured to not restrict flow along said second cavity;

said ~~second~~ third valve is configured to not restrict flow along said second channel;

said ~~third~~ fourth valve is configured to not restrict flow along said third cavity; and

said ~~third~~ fourth valve is configured to not restrict flow along said third channel.

39. (Currently Amended) The pressure swing adsorption system according to Claim 23, wherein said ~~first~~ second valve is configured to not restrict flow along said first channel.

40. (Original) The pressure swing adsorption system according to Claim 23, wherein said first valve is configured to not restrict flow within said first cavity.

41. (Original) The pressure swing adsorption system according to Claim 23, wherein said first body further comprises a sensor port connected to said first cavity.

42. (Original) The pressure swing adsorption system according to Claim 23, wherein said first body further comprises a sensor port connected to said first passage.

43. (Original) The pressure swing adsorption system according to Claim 23, wherein said first body further comprises a sensor port connected to said first channel.

44. (Canceled)

45. (Currently Amended) The pressure swing adsorption system according to Claim 23, wherein said first pressure vessel has a second opening, said pressure swing adsorption system further comprising:

a second valve manifold comprising:

a second body having a second cavity, a ~~second~~ third passage and a second channel, said second cavity being fluidly connected to said second opening of said first pressure vessel, said ~~second~~ third passage connecting said second channel to said second cavity, said second channel being in fluid connection with said first channel; and

a ~~second~~ third valve provided within said ~~second~~ third passage, said ~~second~~ third valve being configured to selectively permit and restrict flow between said second

channel and said second cavity via said ~~second~~ third passage.

46. (Original) The pressure swing adsorption system according to Claim 45, wherein;

said first valve manifold is rigidly connected to said first pressure vessel;

said first valve manifold further comprises a first mounting boss having a pin journal adapted for pivotal connection to a support structure;

said second valve manifold is rigidly connected to said first pressure vessel; and

said second valve manifold further comprises a second mounting boss having a pin journal pivotally connected to a linkage that is adapted for pivotal connection to a support structure.

47. (Original) The pressure swing adsorption system according to Claim 23, wherein said first passage includes a valve seat and a valve port in which said first valve is received.

48. (Original) The pressure swing adsorption system according to Claim 47, wherein said valve seat is concentric with said valve port.

49. (Original) The pressure swing adsorption system according to Claim 23, wherein said first valve includes a valve seal configured to be selectively actuated between a sealed contact position with a valve seat in said first passage wherein said first channel is sealed from said first cavity and a non-contact position with said valve seat, said first valve further including a secondary seal member having a metering orifice.

50.-52. (Canceled)

53. (Currently Amended) A pressure swing adsorption system comprising:
a pressure vessel having an opening; and

a valve manifold comprising:

a body having a cavity, a first passage, a second passage and a channel, said cavity being fluidly connected to said opening of said pressure vessel, said first passage connecting said channel to said cavity, said second passage connecting said channel to said cavity;

first means for selectively permitting and restricting fluid flow between said channel and said cavity through said first passage; and

second means for selectively permitting and restricting fluid flow between said channel and said cavity through said second passage,

wherein said first passage and said second passage are directly connected to said channel, and

wherein said first means is configured to not restrict flow along said first channel.

54.-57. (Canceled)

58. (Previously Presented) A pressure swing adsorption system comprising:

a plurality of pressure vessels;

a first integrated manifold having a plurality of first cavities interconnected by at least two first channels, each first cavity of said plurality of first cavities being connected to a first opening of a vessel of said plurality of pressure vessels, wherein each of said at least two first channels are selectively connected to each first cavity by at least one first valve; and

a second integrated manifold having a plurality of second cavities interconnected by at least two second channels, each second cavity of said plurality of second cavities being

connected to a second opening of a vessel of said plurality of pressure vessels, wherein each of said at least two second channels are selectively connected to each second cavity by at least one second valve.

59. (Previously Presented) The pressure swing adsorption system according to Claim 58, wherein:

said first integrated manifold has two first channels, wherein each of said first channels are selectively connected to each first cavity by one first valve; and

said second integrated manifold has three second channels, each of said second channels are selectively connected to each second cavity by one second valve.

60. (Previously Presented) The pressure swing adsorption system according to Claim 58, wherein said at least two first channels are configured to provide parallel flow connection to said plurality of first cavities, and wherein said at least two second channels are configured to provide parallel flow connection to said plurality of second cavities.

61. (Previously Presented) The pressure swing adsorption system according to Claim 58, wherein said at least one first valve is configured to not restrict flow along a respective first channel, and wherein said at least one second valve is configured to not restrict flow along a respective second channel.

62. (Previously Presented) The pressure swing adsorption system according to Claim 58, wherein said at least one first valve is configured to not restrict flow within a respective first cavity, and wherein said at least one second valve is configured to not restrict flow with a respective second cavity.

63. (Previously Presented) The pressure swing adsorption system according to Claim

58, wherein said at least one first valve comprises:

- a non-return valve;
- a metering orifice provided in parallel with said non-return valve; and
- an on/off valve provided in series with said non-return valve and said metering orifice.

64. (Previously Presented) The pressure swing adsorption system according to Claim 63, wherein:

- said non-return valve comprises a seal cup configured to receive said on/off valve therein;

- said metering orifice is provided through said seal cup; and

- said seal cup is spring biased toward a valve seat.

65. (Previously Presented) The pressure swing adsorption system according to Claim 63, wherein said at least one first valve includes a motive device configured to linearly actuate said on/off valve in contact with and out of contact with a valve seat.